155 Isolation of fungi from nebuliser devices used by people with cystic fibrosis

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Objectives: Nebulised therapy plays a major role in the treatment of CF. Maintaining nebuliser hygiene is time consuming and if inadequate can result in fungal contamination. The aim of this study was to assess the prevalence of fungal contamination in nebuliser devices.
Methods: Adult patients were prospectively recruited. Nebulisers were sampled using wet sterile swabs. Samples including controls were plated out on Sabouraud agar and on Scel+ agar to select for *Scedosporium* sp. and incubated at 27ºC for up to 2 weeks. Yeasts were identified by germ tube test, Auxacolour, or MALDI-TOF examination. Moulds were identified by microscopy, or examination of rRNA gene and spacer sequence.
A total of 275 devices/i-neb chambers from 149 subjects were swabbed. In addition swabs were taken from the horn of 94 i-neb devices. Fungal cultures were positive in one or more devices from 86 (57.7%) patients. In 39/149 (26.2%) of study subjects yeasts were isolated, in 47/149 (31.5%) moulds and 20/149 (13.4%) yeasts and moulds. Contamination was not associated with any particular medication and there was no significant difference between the contamination rate of and different devices. *Aspergillus* sp. were isolated from 28 (10.4%) devices, *Scedosporium* sp. were not isolated from any devices. There was no obvious correlation between positive culture from devices and previous sputum specimens.
Conclusion: Nebuliser devices are frequently contaminated by moulds and yeasts, resulting in a potential vehicle for infection. More emphasis should be placed on ensuring adequate nebuliser hygiene and the development of disposable devices.
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156 Chronic airway colonization by *Aspergillus fumigatus* (Af) in patients with cystic fibrosis (CF): Does it contribute to lung function decline?

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Background: *In vitro* studies showed that Af can produce a biofilm on CF bronchial epithelial cells. In the absence of allergic bronchopulmonary aspergillosis (ABPA), the impact of persistence of Af in the airways on the course of lung disease remains unclear.
Objectives: To assess clinical characteristics and FEV_1 decline in patients with CF and chronic airway colonization by Af compared to control subjects.
Methods: 179 children and adults with CF with at least 3 sputum cultures/year in the last 4 years were considered. Chronic airway colonization was defined as the presence of more than 50% of positive cultures for Af in two consecutive years (Group A). For each case two control subjects were matched for sex, age, mean value of FEV_1 and presence/absence of *P. aeruginosa* in sputum cultures (Group B). Individual decline in FEV_1 during the last 4 years was evaluated using llinear regression analysis.
Results: 14/179 (8%) of patients had chronic airway colonization by Af. Patients in Group A had a median (IQR) age of 23.9 (20.5, 44.5) years; only one patient fulfill criteria for ABPA and 7/14 patients had concomitant chronic airway infection by *P. aeruginosa*. The median value of FEV_1 in the last 2 years was 60 (35, 74) and 61 (44, 70) % predicted in Group A and B, respecitively. There was no difference in the median value of FEV_1 decline in the two groups [A: –0.46 (–2.61, 1.11) % pred/yr; B: –1.72 (–3.37, –0.29) % pred./yr].
Conclusion: 8% of adults had chronic airway colonization by Af. It was not associated with deterioration of lung function. To ascertain the role of Af a longer period of chronic airway colonization should be prospectively evaluated.

157 Epidemiology of aspergillosis in CF and response to antifungal therapy

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Objectives: *Aspergillus* sp., particularly *A. fumigatus* are frequently isolated from respiratory samples from people with cystic fibrosis (CF). The clinical significance of such isolates can be difficult to determine. The aim of this study was to determine risk factors for *Aspergillus* disease including allergic bronchopulmonary aspergillosis (ABPA) and *Aspergillus* bronchitis (AB).
Method: The data from a cohort of 473 people (age over 16 years) was extracted from the unit's electronic patient management system (Egton Medical Information Systems) between 2009 and 2011. We examined parameters including, age, height, weight, lung function, C-reactive protein measurements, blood counts, fungal cultures, Microbiology, symptomology, radiology, antibiotic therapy, steroid treatment, and comorbitidies. Factors associated with ABPA and AB were identified by multivariate logistic regression analysis.
Result: Factors associated with ABPA included eosinophilia and the presence of a "tree-in-bud" sign on chest CT; factors associated with AB included isolation of *Rasamsonia argillacea* or *Scedosporium apiospermum,* use of certain antibiotics and raised white cell count. Ninety-seven patients were treated with mould-active antifungals and responses categorised as positive response to treatment or treatment failure.
Conclusion: Early results have identified specific factors associated with ABPA and AB. Similar analysis of factors associated with positive response to treatment is still being analysed and will be presented.

158 *Trichosporon mycotoxinivorans* – Epidemiological and clinical aspects of an uncommon fungus identified in patients with cystic fibrosis

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Objectives: *Trichosporon mycotoxinivorans* has been reported as an emerging pathogen in CF patients. Due to misidentification by commercially available yeast identification systems it may be underdiagnosed as a *Trichosporon* species other than *Trichosporon mycotoxinivorans* or even as *Cryptococcus* species.
Methods: *Trichosporon* isolates were identified phenotypically and by sequencing of the internal transcribed spacer (*ITS*) regions of rDNA, in vitro susceptibility testing was performed by CLSI methodology. Genotyping has been performed by sequencing of the RNA polymerase II second largest subunit (*RPB2)* and the intergenic spacer (*IGS*) region.
Results: Since 2009 ten patients between 12 and 30 yrs of age in Germany have been identified to be colonized by *Trichosporon mycotoxinivorans.* Respiratory function deteriorated in selected patients. All isolates of untreated patients were in vitro susceptible to voriconazole, whilst those obtained during antifungal treatment showed a rapid development of resistance to voriconazole, associated with a prominent decrease of FEV1. The source of infection remains unclear. Genotyping revealed a diverse genetic background among the isolates.
Conclusion: *Trichosporon mycotoxinivorans* is increasingly identified in CF patients and can be associated with worsening of the pulmonary function. Systemic antifungal therapy seems to be limited by rapid development of in vitro resistance under azole monotherapy.